

Evaluation Board for the **ADG798** High Temperature, Low Voltage, 8-Channel Multiplexer

FEATURES

- High temperature operation up to 210°C
- Supply voltages
 - Dual supply: ± 2.5 V
 - Single supply: 3.0 V to 5.5 V
- Parallel interface compatible with 3 V logic

EVALUATION KIT CONTENTS

- [EVAL-ADG798EB1Z](#) evaluation board

ONLINE RESOURCES

Documents Needed

- [ADG798](#) data sheet
- [EVAL-ADG798EB1Z](#) user guide

EQUIPMENT NEEDED

- DC voltage sources
 - ± 2.5 V for dual supply
 - 3.0 V or 5.5 V for single supply
- Digital logic supply: 3 V to 5 V
- Analog signal source
- Method to measure voltage, such as a digital multimeter (DMM)

GENERAL DESCRIPTION

The [EVAL-ADG798EB1Z](#) is the evaluation board for the [ADG798](#), which is a high temperature, 8:1 multiplexer. The entire board assembly is constructed with high temperature compliant materials and is suitable for short duration evaluation up to 210°C.

Figure 1 shows the [EVAL-ADG798EB1Z](#) in a typical evaluation setup. The [ADG798](#) is soldered to the center of the evaluation board, and headers are provided to connect to each of the source and drain pins. A 4-pin header powers the device and provides a user defined digital logic supply voltage.

Full specifications on the [ADG798](#) are available in the [ADG798](#) data sheet, which should be consulted in conjunction with this user guide when using the evaluation board.

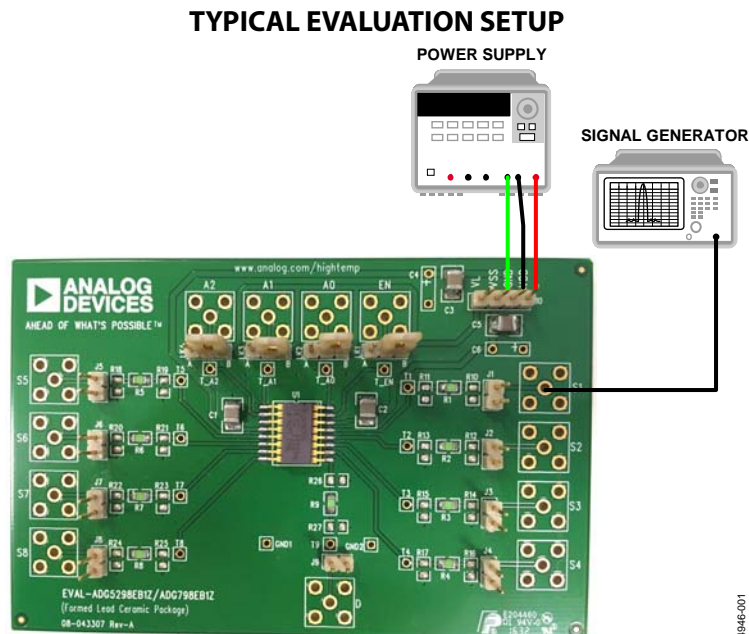


Figure 1. [EVAL-ADG798EB1Z](#), Power Supply, and Signal Generator

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REVISION HISTORY

9/2016—Revision 0: Initial Version

GETTING STARTED

EVALUATION BOARD SETUP PROCEDURE

The EVAL-ADG798EB1Z evaluation board operates independently and does not require any additional evaluation boards or software to operate.

Supply the evaluation board with a dual power source of ± 2.5 V, or a single supply from 3.0 V to 5.5 V, by connecting VSS and GND together.

Set up a functionality test as follows:

1. Connect a power supply to J10. Connect VSS and GND together if a single supply is required.
2. Use LK1 through LK4 to control the digital signals for the ADG798. See Table 1 for the logic control truth table.

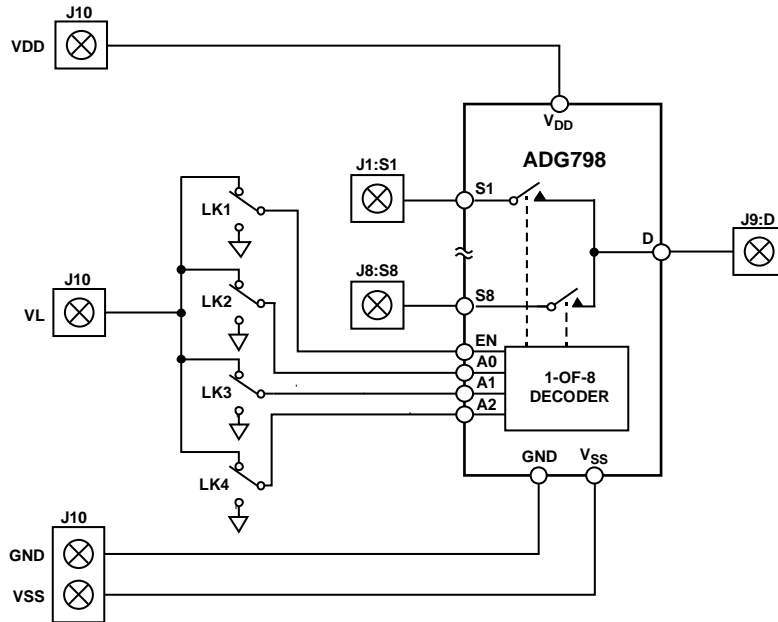


Figure 2. EVAL-ADG798EB1Z Block Diagram

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EVALUATION BOARD HARDWARE

Evaluate the operation of the [ADG798](#) using the [EVAL-ADG798EB1Z](#). Figure 1 shows a typical evaluation setup where only a power supply and signal generator are required. Figure 2 shows the block diagram of the main components of the evaluation board.

Using the [EVAL-ADG798EB1Z](#) evaluation board, the [ADG798](#) passes signals from either the source or drain connectors.

POWER SUPPLY

Connector J10 provides access to the supply pins of the [ADG798](#). VDD, GND, and VSS on J10 link to the appropriate pins on the [ADG798](#). For dual-supply voltages, the evaluation board can be powered by ± 2.5 V. For single-supply voltages, the GND and VSS terminals must be connected together, and the evaluation board must be powered with a 3.3 V to 5.5 V voltage range. Use the J10 header to supply the voltage that controls the digital logic voltage level (VL).

INPUT SIGNALS

Headers connect to both the source pins and the drain pins of the [ADG798](#). Additional subminiature Version B (SMB) connector pads are available if extra connections are required.

Each trace on the source and drain side includes two sets of 0805 pads, which can be used to place a load on the signal path

to ground. A $0\ \Omega$ resistor is placed in the signal path and can be replaced with a user defined value. The resistor, combined with the 0805 pads, creates a simple resistor-capacitor (RC) filter.

The [ADG798](#) uses a parallel interface to control the operation of the switches. The switch operation can be manually controlled using the LK1 to LK4 switches, or an external controller can be interfaced directly to the control pins by using the SMB connector pads, if required (EN, A0, A1, and A2). See Table 1 for the logic control truth table.

BOARD CONSTRUCTION

The entire board assembly uses high temperature rated components, including passives, connectors, printed circuit board (PCB) material, and solder material. A polyimide PCB laminate is used due to its very high glass transition temperature (T_G), which allows the board to maintain integrity at high temperature when standard laminate typically deteriorates. Sn90Sb10, Pb-free solder is used due to its high melting point (245°C to 250°C). NiAu surface finish (plating) is used on the PCB to avoid intermetallic formation between the tin in the solder with copper PCB traces at high temperatures. The resistors, capacitors, and connectors used are rated for extended temperature by their respective manufacturers. For more details on the board construction, see the bill of materials in Table 3.

JUMPER SETTINGS

SWITCHES AND 0 Ω RESISTORS

Links are used to control the [ADG798](#) manually. Table 2 shows a summary of the links.

Use LK2 to LK4 to control the switches of the [ADG798](#). Position L is tied to GND and sets the logic low, and Position H is tied to VL and sets the logic high.

Use LK1 to enable or disable the device. Position L is tied to GND and disables the device, and Position H is tied to VL and enables the device.

SMB CONNECTORS

The parallel interface of the [ADG798](#) is controlled manually using the link headers of LK1 to LK4. The parallel interface can also be accessed using the SMB footprints: EN, A0, A1, and A2. Note that these footprints are unpopulated.

DECOUPLING CAPACITORS

The board comes with 0.1 μF decoupling capacitors populated on both the VDD and VSS power supplies. This provides sufficient decoupling for the [ADG798](#). However, if extra decoupling is required due to a particular reason, such as a noisy power supply, use C4 and C6 to add additional decoupling capacitors.

Table 1. ADG798 Truth Table¹

LK4 (A2)	LK3 (A1)	LK2 (A0)	LK1 (EN)	Connected Sx
X	X	X	L	All switches off
Position L	Position L	Position L	Position H	S1
Position L	Position L	Position H	Position H	S2
Position L	Position H	Position L	Position H	S3
Position L	Position H	Position H	Position H	S4
Position H	Position L	Position L	Position H	S5
Position H	Position L	Position H	Position H	S6
Position H	Position H	Position L	Position H	S7
Position H	Position H	Position H	Position H	S8

¹ X means don't care.

Table 2. Switch and 0 Ω Resistor Descriptions

Label	Position	Description
LK1	L	Logic 0 on the EN pin
	H	Logic 1 on the EN pin
LK2	L	Logic 0 on the A0 pin
	H	Logic 1 on the A0 pin
LK3	L	Logic 0 on the A1 pin
	H	Logic 1 on the A1 pin
LK4	L	Logic 0 on the A2 pin
	H	Logic 1 on the A2 pin

EVALUATION BOARD SCHEMATICS AND ARTWORK

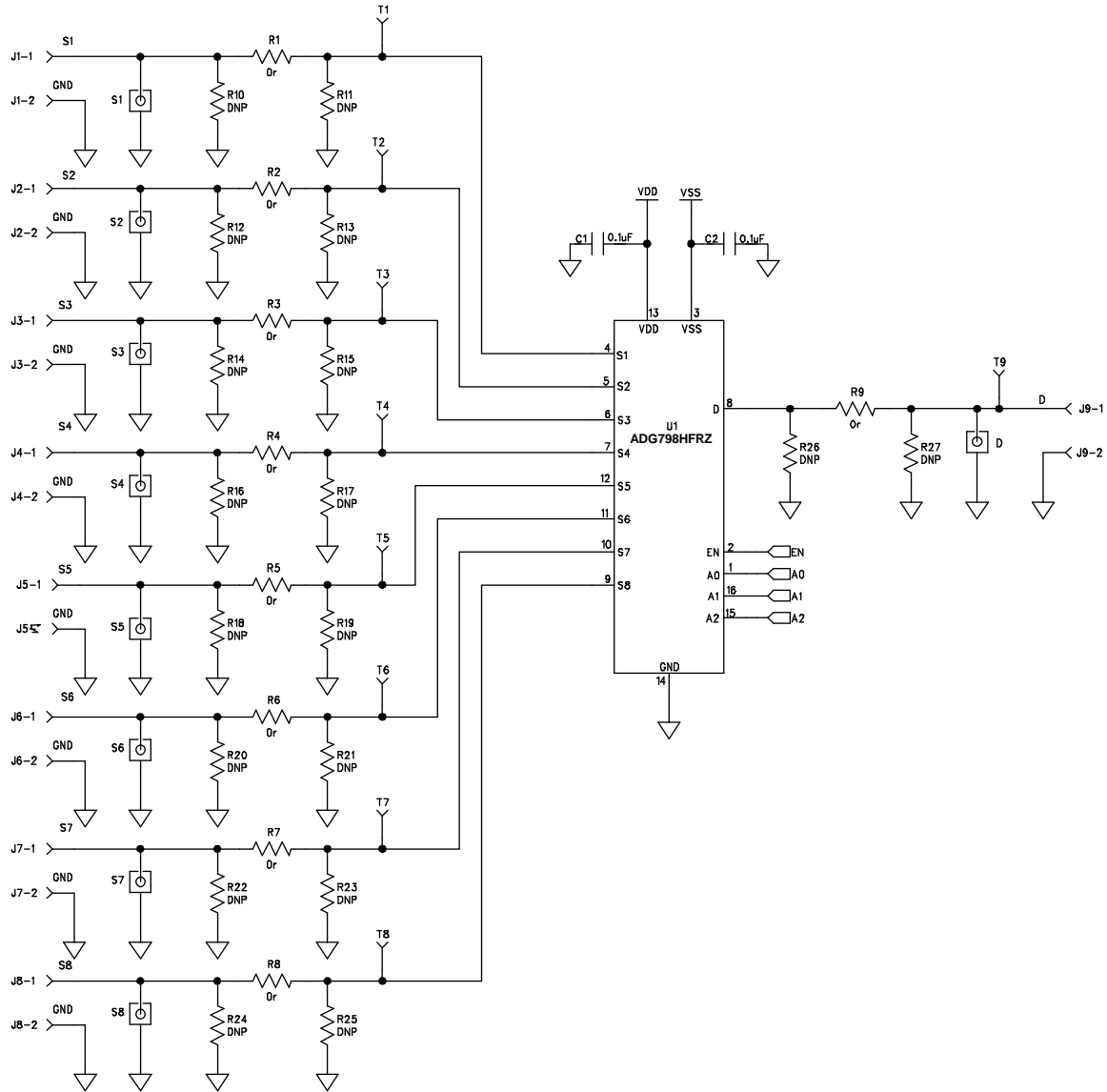


Figure 3. ADG798 Evaluation Board Schematic (Part 1)

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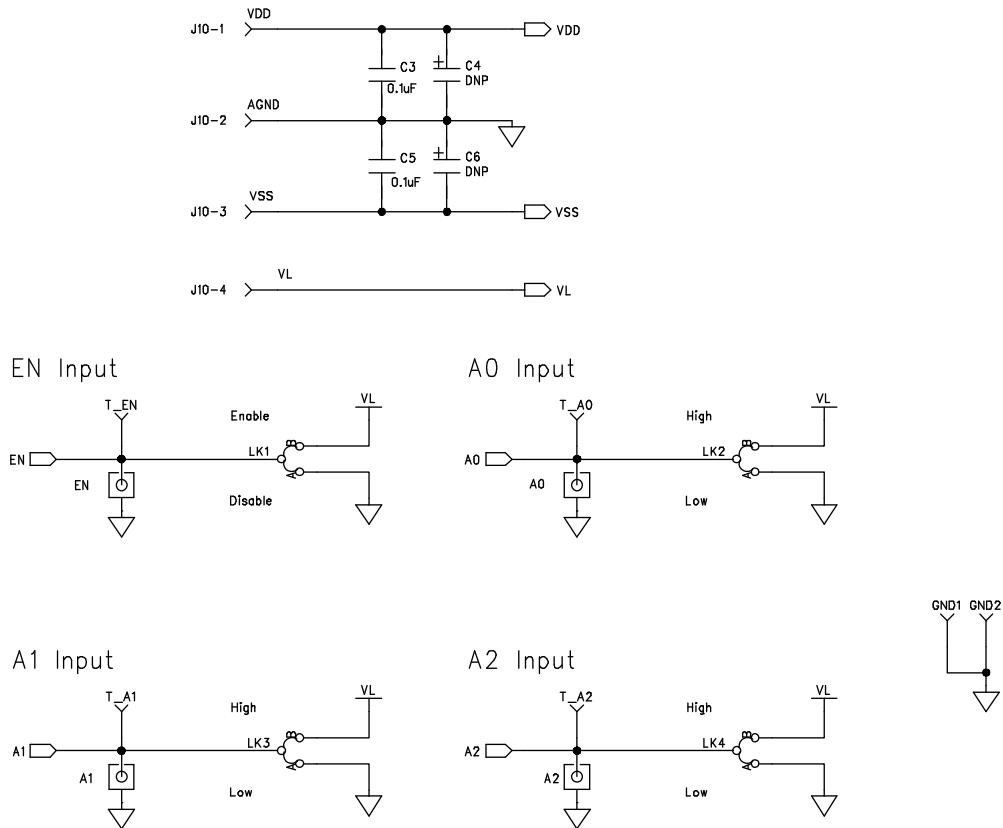


Figure 4. ADG798 Evaluation Board Schematic (Part 2)

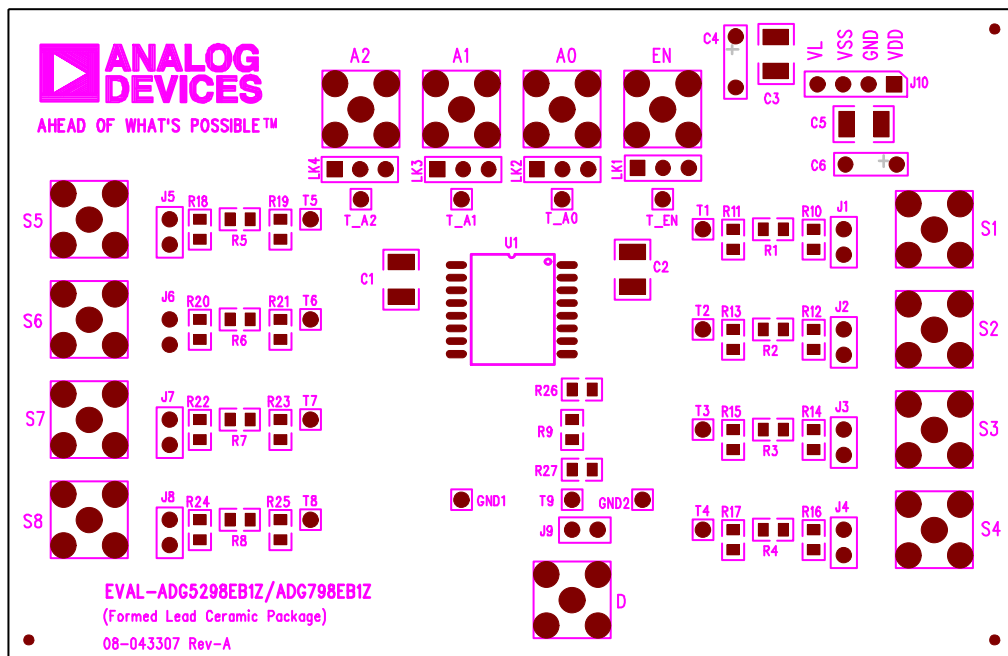
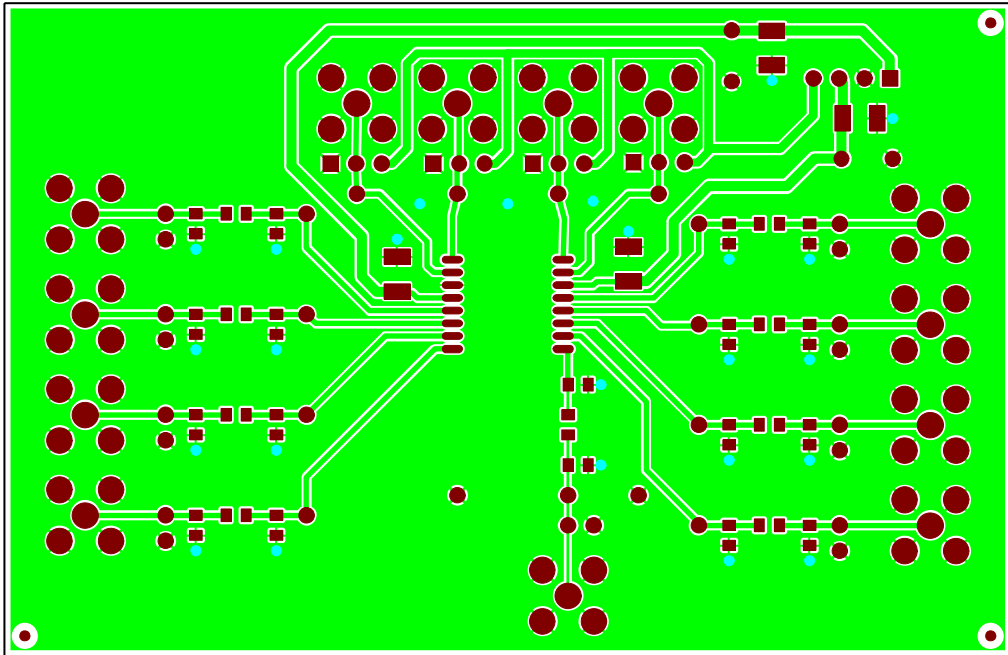
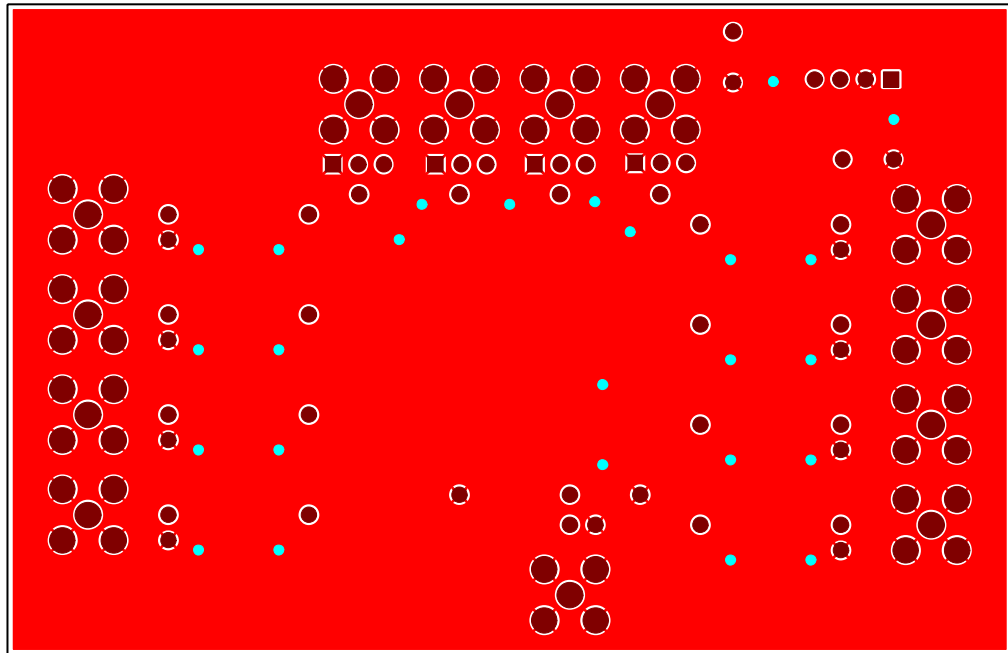


Figure 5. EVAL-ADG798EB1Z Silkscreen



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Figure 6. EVAL-ADG798EB1Z Top Layer



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Figure 7. EVAL-ADG798EB1Z Bottom Layer

ORDERING INFORMATION

BILL OF MATERIALS

Table 3.

Reference Designator	Description	Manufacturer Part Number	Stock Code
A0 to A2, EN, S1 to S8, D	50 Ω, straight, SMB jacks	Not applicable	Do not insert
C1 to C3, C5	Ceramic capacitor, 0.1 μF, 100 V, NP0 1210	C1210H104J1GACTU	Digikey 399-5748-2-ND
C4, C6	Through hole, electrolytic capacitor	Not applicable	Do not insert
T1 to T9, T_A0 to T_A2, T_EN, GND1, GND2	Test point	Not applicable	Do not insert
J1 to J9	Vertical, high temperature series, through hole, header, 2 positions, 2.54 mm	YMC02SAAN	Digikey S9665-02-ND
J10	Vertical, high temperature series, through hole, header, 4 positions, 2.54 mm	YMC04SAAN	Digikey S9665-04-ND
R1 to R9	0 Ω, 0805, 0.125 W, maximum operating temperature = 300°C	SPJ3003-0RN1	Trendsetter Electronics SPJ3003-0RN1
R10 to R27	SMD, 0805 resistors	Not applicable	Do not insert
LK1 to LK4	Vertical, high temperature series, through hole, header, 3 positions, 2.54 mm, and shorting link	YMC03SAAN and WDC02SXNN	Digikey S9665-03-ND and Digikey S9663-ND
U1	High temperature, high voltage, latch-up proof, 8-channel multiplexer;	ADG798HFRZ	ADG798HFRZ
Not applicable	Solder, Sn90Sb10 alloy	Indium indalloy 259 solder paste, 8.9 HF	Not applicable



ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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